



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

6/12/00

MEMORANDUM

SUBJECT: Phosalone: Registrant's Response to Product and Residue Chemistry Data Requirements. Chemical I.D. No. 097701. Case No. 0027. DP Barcode D261763 and D262645.

FROM: William J. Hazel, Ph.D., Chemist
Reregistration Branch 1
Health Effects Division (7509C)

THRU: Whang Phang, Ph.D., Branch Senior Scientist
Reregistration Branch 1
Health Effects Division (7509C)

TO: Deanna Scher/Susan Lewis (PM 51)
Special Review and Reregistration Division (7508W)

Attached is a response by Aventis CropScience (formerly Rhone-Poulenc Ag Company or RPAC) to certain product and residue chemistry data gaps listed in the 11/1/99 preliminary Human Health Risk Assessment for **Phosalone** developed by the Health Effects Division (HED). The submitted data have been reviewed by Dynamac Corp., an EPA contractor, and have been modified to reflect Agency policies.

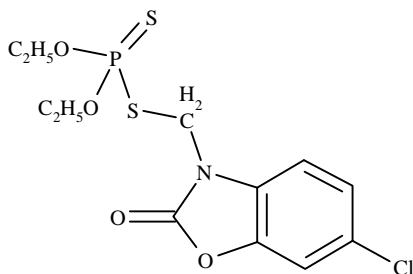
Phosalone is not an active ingredient in any product registered in the U.S. Aventis is supporting tolerances for phosalone residues in almonds, grapes, pome fruits, and stone fruits to permit the importation of these commodities. Note that phosalone is reportedly marketed largely in Europe. In association with the preliminary Human Health Risk Assessment, HED evaluated the field trial data in terms of the European Union (EU) Good Agricultural Practices (GAPs) including application rate, preharvest intervals, and number of applications as well as registered Canadian uses. Additional field trials conducted in Canada (grape, apple, pear, cherry, peach, and plum) and France (grape only) were recommended before tolerances can be reassessed. The subject Aventis submission pertains to new Canadian field trials conducted on apple and cherry. The submitted data are adequate to support tolerance reassessment for

cherry but inadequate for apple; an additional apple field trial should be conducted in which the 500 g/L FIC and the 350 g/L EC are applied in side-by-side Canadian trials.

The submitted product chemistry data (beginning materials, discussion of the formation of impurities, and UV/visible absorption) are adequate.

cc: W. Hazel (HED), List A Reg. Std. File, RF
RRB1:CM2:722J:WHazel:305-7677:wjh:6/7/00
RDI: F. Fort: 6/7/00: W.Phang:6/7/00

Phosalone



(PC No. 097701; Case No. 0027)

DP Barcodes D261763 and D262645

REGISTRANT'S RESPONSE TO PRODUCT AND RESIDUE CHEMISTRY DATA REQUIREMENTS

BACKGROUND

The U.S. registrations for the insecticide phosalone [*O,O*-diethyl S-[(6-chloro-2-oxobenzoxazolin-3-yl)methyl] phosphorodithioate] were voluntarily withdrawn in 1989 by the registrant, Rhône-Poulenc Ag Company (RPAC). However, RPAC requested that the Agency not revoke tolerances for phosalone residues in/on almonds, grapes, pome fruits (apples and pears), and stone fruits (apricots, cherries, peaches, and plums) so that these commodities could continue to be imported legally into the U.S. In the Final Rule published in the Federal Register of 10/26/98 (corrected 1/25/99), the Agency agreed to maintain the existing tolerances for residues of phosalone in/on these commodities while revoking the remaining phosalone tolerances.

Outstanding data requirements and reassessment of the remaining phosalone tolerances were recently discussed in the Phosalone Reregistration Eligibility Decision (RED) Residue Chemistry Chapter (DP Barcode D256367, K. EL-Attar, 11/1/99). The RED required additional product chemistry data pertaining to beginning materials, discussion of the formation of impurities, and UV/visible absorption. The Phosalone RED also required additional field trial data reflecting the French use pattern on grapes and the Canadian use pattern on grapes, apples, pears, cherries and peaches; field trial data and directions for use information for plums; and the revision of labels for non-EU countries to specify maximum seasonal use rates.

In response, RPAC (now Aventis CropScience) has submitted product chemistry data (1999, MRIDs 44986101 and 44986102) and magnitude of the residue studies conducted in Canada on apples and cherries (1999, MRIDs 45013401 and 45013402). The Conclusions and Recommendations stated in this review pertain only to product chemistry data requirements and the requirement for residue data on apples and cherries in Canada; no other requirements are addressed here.

The nature of phosalone residues in plants is adequately understood based on acceptable apple and grape metabolism studies. The Metabolism Assessment Review Committee (MARC) determined parent phosalone as the only residue of concern to be regulated in/on plant commodities (K. EL-Attar 10/04/99). Tolerances are currently established under 40 CFR §180.263. for residues of phosalone *per se* in/on almonds and almond hulls (0.1 and 50.0 ppm, respectively); apples, grapes and pears (10.0 ppm); and apricots, cherries, peaches, and plums (15.0 ppm); no tolerances are established for phosalone residues in processed plant commodities. Based upon the available livestock feeding study and the current use pattern, the Agency has determined that tolerances for phosalone residues in livestock commodities are not required [40 CFR §180.6(a)(3)]. Adequate methods are available for the enforcement of established tolerances, as currently defined.

Aspects concerning the harmonization of U.S. tolerances with Codex MRLs were recently discussed in the Phosalone RED.

CONCLUSIONS AND RECOMMENDATIONS

1. All product chemistry data requirements pertaining to the reregistration of phosalone have been fulfilled (see Attachment I).
2. The GC/MS method (modification of RP Method 148-97) used in the magnitude of the residue studies is adequate for determining phosalone residues in/on apples and cherries. The validated LOQ for phosalone residues is 0.05 ppm for apples and cherries, and the estimated LOD is 0.02 and 0.01 ppm for apples and cherries, respectively.
- 3a. Although the submitted apple field trial data are adequate, an insufficient number of tests were conducted and all major formulation classes were not tested. To support the tolerance for phosalone in/on imported apples and pears (pome fruits), the Phosalone RED (11/99) required three additional tests on apples and two tests on pears in Canada or contiguous U.S. regions at rates equivalent to 1x the maximum rate specified by Canadian Good Agricultural Practices (GAP). An additional field trial on apples conducted in Canada is required; side-by-side applications of the 500 g/L FLC and the 350 g/L EC should be made according to the Canadian GAP. [Note that we will consider the 500 g/L FLC and the 30% WP formulations to be equivalent in this case.] The requirement for pear

field trials will be addressed in the Agency response to registrant comments on the preliminary Human Health Risk Assessment (W. Hazel, 6/00, D263987).

- 3b. A total of two tests were conducted in the major apple growing region of Canada (Region 11). Residues of phosalone were 0.75-1.95 ppm in/on four treated apple samples harvested ~30 days following the last of three foliar applications of phosalone (500 g/L FIC) at 1.5 kg ai/ha/application, totaling 4.5 kg ai/ha (1x the Canadian GAP).
- 4a. The submitted residue data on cherries are adequate and tentatively fulfill the requirement for field trials on cherries grown in Canada. A total of five tests were conducted in the principal cherry growing regions of Canada. Residues of phosalone were 0.88-3.6 ppm in/on four samples of tart cherries and 0.40-1.2 ppm in/on six samples of sweet cherries harvested ~14 days following the second of two foliar applications of phosalone (500 g/L FIC) at 1.5 kg ai/ha/application, totaling 3.0 kg ai/ha (1x the Canadian GAP). As the 350 g/L EC was not tested, we will determine the need for additional trials based on the outcome of side-by-side comparisons of the residues resulting from treatments with the 500 g/L FIC and the 350 g/L EC on other commodities [see the Agency response to registrant comments (W. Hazel, 6/00, D263987)].
- 4b. To support import tolerances on stone fruits, residue data reflecting the maximum Canadian use rate on peaches and plums (4.5 kg ai/ha/season) remain outstanding. In the preliminary Human Health Risk Assessment, three tests each were required on peaches and plums in Canada, for a total of six tests [see the Agency response to registrant comments (W. Hazel, 6/00, D263987)].

DETAILED CONSIDERATIONS

OPPTS GLNs 860 Series: Product Chemistry Data

In response to an Agency memorandum (DP Barcode D260636, K EL-Attar, 11/1/99), Aventis has submitted supplemental product chemistry data (1999; MRIDs 44986101 and 44986102) concerning the phosalone 94% TGAI; these data are discussed in Attachment I. All product chemistry data requirements pertaining to the reregistration of phosalone have been fulfilled.

OPPTS GLN 860.1340: Residue Analytical Methods

In conjunction with the magnitude of the residue studies, Aventis submitted a method description for a GC/MS method for determining residues of phosalone in/on apples and cherries. This method is essentially identical to a GC/ECD method (Method AR 148-97; reviewed under DP Barcode D260637, K. EL-Attar, 11/1/99) previously used for analysis of phosalone in plant samples. In the current studies, Method AR 148-97 was modified to use centrifugation instead of

filtration for the initial extracts and residues were determined by GC/MS rather than by GC/NPD. Sample analyses were performed by Enviro-Test Laboratories (ETL), Edmonton, Alberta.

For this method, residues of phosalone are extracted with 80% acetone, centrifuged, and concentrated to an aqueous phase. Residues are then partitioned into dichloromethane, concentrated, redissolved in toluene, and analyzed by GC/MS in the select ion monitoring mode (scanning for 182, 184, and 367 m/e ions). The validated LOQ is 0.05 ppm for apples and cherries, and the estimated LOD is 0.02 and 0.01 ppm for apples and cherries, respectively.

For method validation, control samples of apples and cherries were fortified with phosalone at 0.05, 0.25, and 2.5 ppm and analyzed along with control samples. Overall method recoveries of phosalone from fortified control samples of apples and cherries were 79-102%. Apparent residues of phosalone were <LOQ (<0.05 ppm) in/on two control samples each of apples and cherries.

Fortified control samples of apples and cherries were also analyzed concurrently with the residue samples. Two control apple samples were fortified with phosalone at 0.05 and 2.5 ppm and four control cherry samples were fortified with phosalone at 0.05-3.5 ppm. Concurrent method recoveries were 82-117%. Apparent residues of phosalone were <LOQ (<0.05 ppm) in/on two control apple samples and were <LOD (<0.01 ppm) in/on three cherry control samples; two cherry control samples bore apparent phosalone residues of 0.32 and 0.63 ppm. Adequate sample calculations, raw data, and representative chromatograms were provided. These data indicate that the GC/MS method is adequate for collecting data on residues of phosalone in/on apples and cherries.

Table 1. Recovery of phosalone from fortified apple and cherry control samples using a GC/MS method (modification of RP Method AR148-97).

Crop	MRID	Fortification level (ppm)	# of samples	% Recovery	
				Range	Ave. \pm SD
Method Validation Recoveries					
Apples	45013401	0.05-2.5	6	87-102	98 \pm 9.3
Cherries	45013402	0.05-2.5	6	79-95	89 \pm 5.9
Concurrent Method Recoveries					
Apples	45013401	0.05, 2.5	2	88, 103	96
Cherries	45013402	0.05-3.5	5	82-117	97 \pm 13

OPPTS GLN 860.1500: Magnitude of the Residue in Plants

Pome Fruits (Apples)

A tolerance has been established for phosalone residues in/on apples at 10 ppm [40 CFR §180.263]. No food/feed uses for phosalone are currently registered in the U.S. However, Aventis is maintaining uses on pome fruits in countries that export treated commodities into the U.S. The supported phosalone products include emulsifiable concentrate (350 g/L EC), flowable concentrate (500 g/L FIC), and wettable powder (30% WP) formulations marketed, primarily in Europe, under the trade names Zolone® and Rubitox®.

Aventis is supporting the use of phosalone on pome fruits in Europe and Japan as a foliar application at 0.6 kg ai/ha/application for a total of three applications per season (1.8 kg ai/ha) at pre-harvest intervals (PHIs) ranging from 14-28 days. However, the Canadian GAP allows for three applications at 1.5 kg ai/ha/application for a maximum use rate of 4.5 kg ai/ha/season and specifies a PHI of 30 days

Aventis has submitted data depicting residues of phosalone in/on apples (1999, MRID 45013401) from two tests conducted in Canada during 1999 in British Columbia (BC). In both tests, phosalone (500 g/L FIC; Zolone Flo) was applied three times at 1.48-1.51 kg ai/ha/application, for a total of 4.5 kg ai/ha/season (1x the maximum Canadian rate), at retreatment intervals of 19-21 days. The phosalone was applied foliarly using airblast ground sprayers in 942-1307 L of water/ha.

A single control and two treated apple samples were harvested from each test site 28 or 29 days following the last application. Samples were frozen within 9 hours of harvest and were shipped frozen on dry ice by overnight carrier to the analytical laboratory (ETL, Edmonton, Alberta). Samples were held at -20 ± 6 C for 66-73 days between sampling and analysis. Data are available (Phosalone RED, 11/99) indicating that phosalone is stable at -18 C in almonds, apples, cherries, and peaches for at least 19-24 months; no additional storage stability data are required to support the present study.

Residues of phosalone were determined using the adequate GC/MS method described in the above section. The validated LOQ is 0.05 ppm for phosalone in/on apples. Residues of phosalone were 0.75-1.95 ppm in/on four treated samples of apples (Table 2). Apparent residues of phosalone were <0.05 in/on both control samples. Adequate sample calculations, raw data, and representative chromatograms were provided.

Although the submitted apple field trial data are adequate, an insufficient number of tests were conducted and all major formulation classes were not tested. To support the tolerance for phosalone in/on imported apples and pears (pome fruits), the Phosalone RED (11/99) required three additional tests on apples and two tests on pears in Canada or contiguous U.S. regions at rates equivalent to 1x the maximum rate specified by Canadian Good Agricultural Practices (GAP). An additional field trial on apples conducted in Canada is required in which side-by-side applications of the 500 g/L FIC and the 350 g/L EC are made according to the Canadian GAP.

[Note that we will consider the 500 g/L FIC and the 30% WP formulations to be equivalent in this case.] The requirement for pear field trials will be addressed in the Agency response to registrant comments on the preliminary Human Health Risk Assessment (W. Hazel, 6/00, D263987).

Adequate residue data supporting the lower use rate on pome fruits in Europe and Japan are available (DP Barcode D260637, K. EL-Attar, 11/1/99).

Table 2. Residues of phosalone in/on apples following the last of three foliar applications of phosalone (Zolone Flo; 500 g ai/L FIC) at 1.5 kg ai/ha/application (1x Canadian GAP).

Location	PMRA Region ^a	Application Data			PTI ^c (days)	Phosalone Residues (ppm)
		Single Rates (kg ai/ha)	Total Rate (kg ai/ha)	RTI ^b (days)		
Summerland, BC	11	1.48-1.51	4.49	20, 21	28	0.75 1.00
Oyama, BC	11	1.48-1.50	4.47	19, 20	29	1.66 1.95

^a PMRA, Health Canada, Region 11 is contiguous with U.S. EPA Region 11.

^b RTI = retreatment interval.

^c PTI = post-treatment interval.

Stone Fruits (Cherry)

A tolerance has been established for phosalone residues in/on cherries at 15 ppm [40 CFR §180.263]. No food/feed uses for phosalone are currently registered in the U.S. However, Aventis is maintaining uses on stone fruits in countries that export treated commodities into the U.S. The supported phosalone products include emulsifiable concentrate (350 g/L EC), flowable concentrate (500 g/L FIC), and wettable powder (30% WP) formulations marketed, primarily in Europe, under the trade names Zolone[®] and Rubitox[®].

In Europe, Aventis is supporting the use of phosalone on stone fruits at 0.60 kg ai/ha/application for a total of two applications per season (1.2 kg ai/ha) on cherries and three applications per season on peaches (1.8 kg ai/ha). The PHIs for cherries and peaches are 15 and 28 days, respectively. Several labels include the generic stone fruit crop site or include apricots and plums. The Canadian GAP allows for foliar applications of phosalone to cherries, peaches and plums at 1.5 kg ai/ha/application with a maximum of two applications per season on cherries (3.0 kg ai/ha) and three applications per season on peaches and plums (4.5 kg ai/ha).

Aventis has submitted data depicting residues of phosalone in/on sweet and tart cherries (1999, MRID 45013402) from five tests conducted in Canada during 1999 in Ontario (3) and British Columbia (2). In each test, phosalone (500 g/L FIC; Zolone Flo) was applied twice at 1.47-1.57 kg ai/ha/application, for a total of 3 kg ai/ha/season (1x the maximum Canadian rate), at

retreatment intervals of 20-21 days. Phosalone was applied foliarly using airblast ground sprayers in 523-1223 L of water/ha.

A single control and two treated samples of cherries were harvested from each test site 12 or 13 days following the second application. Samples were frozen within 7.5 hours of harvest and were shipped frozen by either overnight carrier or freezer truck to the analytical laboratory (ETL, Edmonton, AB). Samples were held at -20 ± 6 C for 50-75 days between sampling and analysis. Data are available (Phosalone RED, 11/99) indicating that phosalone is stable at -18 C in almonds, apples, cherries, and peaches for at least 19-24 months; no additional storage stability data are required to support the present study.

Residues of phosalone were determined using the adequate GC/MS method described in the above section. The validated LOQ is 0.05 ppm for phosalone in/on cherries, and the LOD is 0.01 ppm. Residues of phosalone were 0.88-3.6 ppm in/on four treated samples of tart cherries and 0.40-1.2 ppm in/on six samples of sweet cherries (Table 3). Apparent residues of phosalone were <0.01 in/on all three control samples, but were 0.32 ppm and 0.63 ppm in/on one control sample each of sweet and tart cherries. Adequate sample calculations, raw data, and representative chromatograms were provided.

The submitted residue data on cherries are adequate and tentatively fulfill the requirement for field trials on cherries grown in Canada. Geographic representation of the residue data is adequate and a sufficient number of tests were conducted on the 500 g/L FIC in the principal cherry growing regions of Canada. As the 350 g/L EC was not tested, we will determine the need for additional trials based on the outcome of side-by-side comparisons of the residues resulting from treatments with the 500 g/L FIC and the 350 g/L EC on other commodities [see the Agency response to registrant comments (W. Hazel, 6/00, D263987)].

Adequate residue data supporting the lower use rate on cherries and peaches in Europe are available (DP Barcode D260637, K. EL-Attar, 11/1/99). However, to support the import tolerances on stone fruits, residue data reflecting the maximum Canadian use rate on peaches and plums (4.5 kg ai/ha/season) remain outstanding. In the preliminary Human Health Risk Assessment, three tests each were required on peaches and plums in Canada, for a total of six tests [see the Agency response to registrant comments (W. Hazel, 6/00, D263987)].

Table 3. Residues of phosalone in/on sweet and tart cherries following the last of two foliar applications of phosalone (Zolone Flo; 500 g ai/L FIC) at 1.5 kg ai/ha/application (1x Canadian GAP).

Location	PMRA Region ^a	Cherry Type	Application Data			PTI ^c (days)	Phosalone Residues (ppm)
			Single Rate (kg ai/ha)	Total Rate (kg ai/ha)	RTI ^b (days)		
Simcoe, Ontario	5	Sweet	1.52	3.06	21	13	1.1
			1.54				0.85
Simcoe, Ontario	5	Tart	1.57	3.03	20	13	3.6, 3.0, 3.0 (3.2) ^d
			1.47				2.5, 2.4, 2.7 (2.5) ^d
Pelham, Ontario	5	Tart	1.53	3.05	20	13	1.3
			1.52				0.88
Kelowna, British Columbia	11	Sweet	1.57	3.08	20	12	1.2
			1.51				1.1
Summerland, British Columbia	11	Sweet	1.55	3.05	20	13	0.48
			1.50				0.40

^a PMRA, Health Canada, Regions 5 and 11 are contiguous with U.S. EPA Regions 5 and 11, respectively.

^b RTI = retreatment interval.

^c PTI = post-treatment interval.

^d Samples were analyzed in triplicate; average value is in parentheses.

AGENCY MEMORANDA CITED

DP Barcode: D255208

Subject: Phosalone. Decision Memorandum for 09/21/99 Meeting of Metabolism Assessment Review Committee regarding the proposal for parent phosalone as the only residue of concern based on apple and grape metabolism studies.

From: K. EL-Attar and K. Farwell

To: G. Kramer

Dated: 10/4/99

MRID(s): None

DP Barcode: D260637

Subject: Phosalone: Residue Chemistry Data Review.

From: K. EL-Attar

To: W. Hazel/D. Scher

Dated: 11/1/99

MRID(s): 44792018-44792046

DP Barcode: D256367

Subject: Phosalone: Reregistration Eligibility Decision Residue Chemistry Chapter.

From: K. EL-Attar

To: W. Hazel/D. Scher

Dated: 11/1/99

MRID(s): None

MASTER RECORD IDENTIFICATION NUMBER

45013401 Cosgrove, D. (1999) Phosalone: Magnitude of Residues in Apples, Canada, 1999: Laboratory Project No: CA99Z02R: 99RP61.REP: 99098DC. Unpublished report prepared by Rhone-Poulenc Canada Inc. and Enviro-Test Laboratories. 139 p. {OPPTS 860.1500}

45013402 Cosgrove, D. (1999) Phosalone: Magnitude of Residues in Cherries, Canada, 1999: Laboratory Project No: CA99Z01R: 99RP51.REP: 99097DC. Unpublished report prepared by Rhone-Poulenc Canada Inc. and Enviro-Test Laboratories. 160 p. {OPPTS 860.1500}

ATTACHMENT I

REVIEW OF PRODUCT CHEMISTRY, OPPTS 830 SERIES

Chemical Name (IUPAC, ANSI, etc.)	Phosalone; S-(6-chloro-3-(mercaptomethyl)-2-benzoxazolinone) O,O-diethyl phosphorodithioate
Chemical Number (CAS; PC Code)	CAS No. 2310-17-0 PC Code 097701
Registration/Symbol No.	None
Type of Product (T, FI, MP, EP)	94% TGAI
DP Barcode(s)	D261763 and D262645

Rhone-Poulenc Ag Company has submitted supplemental product chemistry data (1999; MRIDs 44986101 and 44986102) concerning the phosalone 94% TGAI in response to an Agency memorandum (D260636, 11/1/99, K. EL-Attar) and in support of reregistration of phosalone. Rhone-Poulenc is supporting only foreign uses and import tolerances for phosalone in/on almonds, apricots, apples, cherries, grapes, peaches, pears, and plums/prunes.

Table 1: Manufacturing and Impurity Data for the Rhone-Poulenc 94% TGAI.				
GLN	Requirement	MRID	Status ¹	Details and/or Deficiency ²
830.1550	Product identity and composition		N/A	Not required for the TGAI.
830.1600	Description of materials used to produce the product	44986101	A	Rhone-Poulenc has identified the sources and technical specifications of the starting materials used to produce the TGAI at the current manufacturing facility.
830.1620	Description of production process		A	D260636, 11/1/99, K. EL-Attar
830.1670	Discussion of Impurities	44986101	A	Rhone-Poulenc has confirmed that all impurities present in phosalone TGAI result from the starting materials or known reactions of the process. No post-production impurities are expected from degradation of the ingredients in the product, migration of components of the packaging materials into the product, or carryover of contaminants from production equipment. The TGAI has been found to be stable in commercial containers for a number of years.
830.1700	Preliminary Analysis		A	D260636, 11/1/99, K. EL-Attar
830.1750	Certification of Limits		N/A	Not required for the TGAI.
830.1800	Analytical Methods		N/A	Not required for the TGAI.
¹ A = Acceptable; N = Unacceptable (see Deficiency); N/A = Not Applicable. ² Refer to CBI Appendix A for details.				

Table 2: Physical and Chemical Properties for the Rhone-Poulenc 94% TGAI																																									
GLN	Requirement	MRID	Status ¹	Result ² or Deficiency																																					
830.6302	Color		A	D260636, 11/1/99, K. EL-Attar																																					
830.6303	Physical State		A	D260636, 11/1/99, K. EL-Attar																																					
830.6304	Odor		A	D260636, 11/1/99, K. EL-Attar																																					
830.6313	Stability		A	D260636, 11/1/99, K. EL-Attar																																					
830.6314	Oxidation/Reduction		N/A	Not required for the TGAI.																																					
830.6315	Flammability		N/A	Not required for the TGAI.																																					
830.6316	Explosability		N/A	Not required for the TGAI.																																					
830.6317	Storage Stability		N/A	Not required for the TGAI.																																					
830.6319	Miscibility		N/A	Not required for the TGAI.																																					
830.6320	Corrosion Characteristics		N/A	Not required for the TGAI.																																					
830.7000	pH		A	D260636, 11/1/99, K. EL-Attar																																					
830.7050	UV/Visible Absorption	44986102	A	<table><tr><th>Media</th><th>λ_{max} (nm)</th><th>absorbance</th><th>molar coefficient $\text{mol}^{-1} \times \text{cm}^{-1}$</th></tr><tr><td rowspan="3">acid</td><td>203</td><td>1.2006</td><td>42726</td></tr><tr><td>236</td><td>0.3680</td><td>13096</td></tr><tr><td>284</td><td>0.0830</td><td>2954</td></tr><tr><td rowspan="3">neutral</td><td>202</td><td>1.1442</td><td>40719</td></tr><tr><td>236</td><td>0.3508</td><td>12484</td></tr><tr><td>285</td><td>0.0541</td><td>1925</td></tr><tr><td rowspan="4">base</td><td>208</td><td>0.1690</td><td>6014</td></tr><tr><td>219</td><td>0.8409</td><td>29925</td></tr><tr><td>248</td><td>0.2135</td><td>7598</td></tr><tr><td>304</td><td>0.1516</td><td>5395</td></tr></table> [UV/VIS spectrometer]	Media	λ_{max} (nm)	absorbance	molar coefficient $\text{mol}^{-1} \times \text{cm}^{-1}$	acid	203	1.2006	42726	236	0.3680	13096	284	0.0830	2954	neutral	202	1.1442	40719	236	0.3508	12484	285	0.0541	1925	base	208	0.1690	6014	219	0.8409	29925	248	0.2135	7598	304	0.1516	5395
Media	λ_{max} (nm)	absorbance	molar coefficient $\text{mol}^{-1} \times \text{cm}^{-1}$																																						
acid	203	1.2006	42726																																						
	236	0.3680	13096																																						
	284	0.0830	2954																																						
neutral	202	1.1442	40719																																						
	236	0.3508	12484																																						
	285	0.0541	1925																																						
base	208	0.1690	6014																																						
	219	0.8409	29925																																						
	248	0.2135	7598																																						
	304	0.1516	5395																																						
830.7100	Viscosity		N/A	Not required for the TGAI.																																					
830.7200	Melting Point/ Melting Range		A	D260636, 11/1/99, K. EL-Attar																																					
830.7220	Boiling Point/ Boiling Range		N/A	The TGAI is a solid at room temperature.																																					
830.7300	Density/ Relative Density/ Bulk Density		A	D260636, 11/1/99, K. EL-Attar																																					
830.7370	Dissociation Constant in Water		N/A	D260636, 11/1/99, K. EL-Attar																																					
830.7570	Partition Coefficient (Octanol/Water)		A	D260636, 11/1/99, K. EL-Attar																																					
830.7840	Solubility		A	D260636, 11/1/99, K. EL-Attar																																					
830.7950	Vapor Pressure		A	D260636, 11/1/99, K. EL-Attar																																					

¹ A = Acceptable; N = Unacceptable (see Deficiency); N/A = Not applicable.

² For example, "brown" for 830.6302; "155° C" for 830.7200.